WORK PLAN

I. Project Title and Project Purpose Statement

Teen Environmental Empowerment Program

Mystic Aquarium, a division of Sea Research Foundation (Mystic, CT, 06355) will partner with Coastal Environmental Services of Southeastern Connecticut (CES, Mystic, CT, 06355) and teens in schools across the state to implement the Teen Environmental Empowerment Program. The Program will educate teen leaders in their understanding and stewardship of the Clean Water Act. Under this Initiative, Mystic Aquarium will host the Long Island Sound (LIS) Water Quality Symposium. Participants, ages 14 through 17, will partake in the two-day symposium, developing engaging clean water projects that can be implemented into any community. Mystic Aquarium will work with its contacts at the Connecticut Department of Energy and Environmental Protection (DEEP) and in the Town of Stonington so that these experts may also contribute to the project and impart their knowledge to youth participants.

The **goal** of this Initiative is to inspire teens to develop and disseminate materials based on the Clean Water Act. By providing a framework for participants to address community problems with wastewater, storm water runoff, and their public health implications, this Program will directly address the **Clean Water Act, Section 104 (b)(3)** (Qualified Environmental Statute #1 of the funding opportunity). The time for presenting the public with small tangible ways they can help make a difference has passed. It's time for community leaders to know the actions necessary for making responsible decisions for the environment. Utilizing the enthusiasm and action-oriented nature of teens, the objectives of this initiative are to:

- Increase-environmental literacy of the general public, and in particular teens, in regards to the Clean Water Act;
- Generate-public awareness and education of the threats that waste water and storm water runoff presents to aquatic environments and human health;
- Motivate-environmental stewardship in rural, suburban, and urban settings to protect and restore aquatic resources through community-focused stewardship activities; and
- Provide tangible actions that the public can take to mitigate their impact on aquatic resources.

The primary project deliverables of this initiative include:

- A LIS Water Quality Symposium for teens
- The development of a Clean Water Action Guide and community project to provide regional networking, professional development, and stewardship opportunities for teens on Clean Water Act issues (storm and waste water)

II. Environmental, Public Health and Community Climate Resiliency (if applicable) information about the Affected Community

In September, 2014 the EPA updated its Long Island Sound Study Management Plan. The Plan, originated in 1994, was initially drafted because LIS is a treasured watershed. More than nine million

people live within the LIS shoreline and the waters that drain into it directly affect its residents and natural resources. It is imperative strategies are in place to protect it.[1] The Plan goals include:

- Attaining water quality objectives by reducing pollutant and nutrient loads from land and the tributary waters; and
- Supporting vibrant, informed, and engaged communities that use, appreciate, and help protect LIS.

Both goals have the unique challenges of involving underserved communities along the coast as well as those that fall within the LIS watershed, to better understand the correlation between water quality and human health but to become active participants in the protection of valuable resources. There is a directly correlation between areas of denser population and development and poor water quality/hypoxic events. This is particularly illustrated in the western basin of LIS (Milford – NYC) where the frequency of hypoxic events resulting in biological die off is 90-100%.

Over the past 21 years, LIS communities have been successful in implementing the Plan's recommendations. Accomplishments include:

- Established all of LIS as a "No Discharge Zone" for vessel sewage
- Reduced 35 million pounds per year the amount of nitrogen discharged from 106 wastewater treatment facilities
- Developed a bi-state pollution budget, called Total Maximum Daily Load to reduce nitrogen pollution

There is still work to be done, but by investing in these natural resources, residents of LIS can enjoy clean water, healthy habitats, and shellfish harvesting for years to come.

The Teen Environmental Empowerment Program is particularly timely in that the Connecticut DEEP is unrolling new regulations regarding storm water management. The new rules include action items such as town wide leaf collections, street sweeping, creation of certified storm water management plans, and the development of public education and outreach materials to improve the public's use of pesticides, fertilizers, and other substances that have the potential to end up in storm water. Reactions to the regulations among municipalities have been mixed, and as residents are hearing more and more about the potential changes as well as that responsible practices lend themselves to preserving our environment, it is a critical time in Connecticut to engage teens, the next generation of leaders.

III. Organization's Historical Connection to the Affected Community

The target audience of the proposed Program is teens, ages 14 through 17. By engaging teens already involved in environmental and/or marine conservation efforts at their school, it will cultivate a cadre of environmental stewards who are particularly informed on the issue of water quality and the threats it presents to human health.

A key finding of a 2011 study by the Ocean Project found that teens not only have the highest level of concern regarding ocean health, and are most open to emerging information on this issue, but also are most confident in their ability to make a meaningful impact. This demographic wants to take

[1] Long Island Sound Study Guide Update, September 2014, http://longislandsoundstudy.net/wp-content/uploads/2014/09/SoundUpdate_MakingADifference_forweb.pdf

action immediately, and looks to institutions such as aquariums and zoos for guidance. In addition, two core findings underscore the importance of reaching this group:

- Youth are increasingly asked for advice on environmental issues by the adults in their families; and
- Adults support teaching the younger generations how to care for our ocean planet, even while they themselves may be unsure about issues facing it (especially in regard to global change).

Overall, the survey found that Americans overwhelmingly see themselves as "green-friendly" and are looking for ways to reinforce their self-perception. While this is not an indication that people are willing to commit a 100% more sustainable lifestyle, it does suggest that they are open to taking a few steps in a positive direction and that they want to see themselves as part of the solution rather than the problem.[2] Thus, environmentally-conscious teens will be targeted as a point of entry to reaching their peers and families.

Mystic Aquarium has strong, longstanding partnerships with schools districts across the state, particularly those in underserved and underperforming districts. Currently established relationships include reaching thousands of students in the urban districts of Manchester (inland), New Haven (coastal), New London (coastal), Groton (coastal), and Norwich (riverine), Connecticut. See the chart below for a breakdown of high schools that Mystic Aquarium is currently partnered with.

District	% Minority	% Free/Reduced Meals*
New Haven	1.2	53.7
Manchester	3.7	49.6
New London *Note: New London High School has committed to the proposed project.*	16.9	64.2
Groton *Note: Marine Science Magnet School has committed to the proposed project.*	2.3	37.6
Norwich	5.7	24.9

**Used to demonstrate community need.*

Over the past two years, Mystic Aquarium has worked to develop a model for engaging teen audiences through funding from the National Oceanic and Atmospheric Administration (NOAA) and the National Fish and Wildlife Foundation (NFWF). This project seeks to leverage these investments and Mystic Aquarium's expertise as an informal education leader to further support teens in their development as environmental leaders.

[2] Ocean Project. 2011. America and the Ocean: Annual Update 2011. Retrieved from http://theoceanproject.org/wp-content/uploads/2011/12/TOP_AmericaOceansUpdate2011_online.pdf
http://sdeportal.ct.gov/Cedar/WEB/ResearchandReports/SSPReports.aspx

The Teen Environmental Empowerment Program will bring together teens from schools throughout the state of Connecticut. Working under the theme of water quality and Clean Water Act education, participating youth will actively contribute to the creation of resources on the topic to elevate the issue of poor water quality among the general public and enlist their help in preserving aquatic resources.

Out of 450 Mystic Aquarium volunteers, 27% are teens and an additional subset of students serve on the Youth Conservation Corps, a group of 20 local teenagers interested in marine science and environmental conservation. There are similar youth groups active at aquariums, zoos, and schools throughout the region. These students are already engaged and motivated but do not have "professional development" opportunities available to them that would allow them to expand their knowledge base and connect with other likeminded teens.

Water quality was recently identified by the Aquarium's Youth Conservation Corps as one of the biggest problem affecting aquatic ecosystems. In response to this, the students have designed an action plan that lays out their strategy to educate teens about marine debris – particularly land-based litter and derelict fishing gear – and what they can do to rectify the problem. In March 2013, Mystic Aquarium sent a delegation of these students to present their marine debris action plan during a National Student Summit on the Ocean and Coasts. During this meeting, the Corps representatives shared their information with approximately 16 delegations of teens from aquariums around the country, elevating the prominence of this issue to their peers. As part of their action plan, the students hosted an event during the Aquarium's annual World Oceans Day celebration in June 2013 (See Section VII for scope of grant). When given the correct resources and support, it has been conclusively illustrated that teens can serve as an instrument for environmental change.

IV. Project Description

The Teen Environmental Empowerment Program will consist of:

- A LIS Water Quality Symposium for teens
- The development of a Clean Water Action Guide and community project to provide regional networking, professional development, and stewardship opportunities for teens on Clean Water Act issues (storm and waste water)

The LIS Water Quality Symposium is the next logical step in creating a large scale change as dictated by youth advocates.

Date	Activity
August - December 2015	• Youth Conservation Corps plans LIS Water Quality Symposium • Director will attend EPA Workshop in Washington, DC
January - March 2016	• Participant recruitment • Marketing and public relations of program, informational meetings, confirmation of speakers and activities
April 2016	• LIS Water Quality Symposium held, activities formulated • Youth Conservation Corps drafts and edits action plan and guide, solicits feedback from teens at regional organizations who participated in Symposium

May - June 2016	• Symposium participants conduct project at community site
July - August 2016	• Program evaluation

Activities

LIS Water Quality Symposium: To be held in April 2016, the Symposium will bring together environmentally active teens to learn about, discuss, and act on the issue of water quality. The Symposium will accommodate approximately 25 participants and will include a blend of speakers and interactive workshops. All speaker sessions and workshops will be designed specifically for the intended youth audience to foster the most optimal learning environment as possible. Particular efforts will be made throughout the Symposium to make teens aware of and encourage their use of EPA assets. Mystic Aquarium will extend an invitation to an EPA representative to deliver the opening remarks for the Symposium, and interweave use of various educational resources available on EPA's website.

During the Symposium, participants will

- Attend workshops by Mystic Aquarium, CES, Connecticut DEEP and Town of Stonington representatives on the impacts of waste and runoff storm water on water quality, biodiversity, economics, human health, and methods to mitigate non-point pollution
- Develop a Clean Water Action Guide, an educational resource that seeks to motivate active participation in marine protection and restoration resources for distribution at public events
- Decide on a hands-on, engaging project to be conducted by each delegation in their own community to support Clean Water Act priorities

An outline of proposed topics and activities follows:

Friday Evening

- Welcome/Keynote Session
  - Introduction to Clean Water Act and Water Quality
    - Opportunity for an EPA representative to introduce the prominence of the issue
  - Networking opportunities for teen participants

Saturday

- Plenary Sessions: Water Quality Backgrounders
  - Presentation by a representative from CT DEEP
  - Presentation by a Coastal Environmental Services representative
  - Presentation by the Supervisor of Water Quality for Mystic Aquarium
  - Presentation by the Town of Stonington representative
- In-field Conservation Activities
  - Students will visit the local waste water treatment facility to see firsthand how public water is cleaned.
  - Students will take a boat ride with Coastal Environmental Services Representative to see how pump-outs are performed.
  - Students will have the opportunity to participate in the creation of a community waste water garden, conduct water quality monitoring tests at a local coastal site, or assist in the marking of storm drains.

- Symposium Action Plan
    - Begin the Clean Water Action Guide
    - Collaboratively choose a community project to be created and maintained at the school site.

Clean Water Action Guide

Starting at the Symposium and continuing in the months following, participants will collaborate to create their own end-product deliverable, a clean water interpretive guide. The contents of the guide will be dictated by what was covered during the course of the Symposium. Mystic Aquarium's Youth Conservation Corps will lead the effort in drafting and editing the content and format of the guide. The Corps will solicit feedback from the teen groups at the partner institutions during the course of the summer after the symposium, and will finalize the guide in time for program dissemination efforts.

Community Project

In addition to developing the framework for a Clean Water Action guide, the Symposium will conclude with a discussion about various stewardship projects that the participants could implement in their communities. It is expected that this final project will be a tangible accomplishment that will have a lasting impact on the participating teens' communities. Community project ideas may include a community waste water or rain garden or storm water/rain water harvest systems. Participating teens and group leaders will then take their plan back to their community to implement with their peers during the remainder of the project period. The project may take place at participating schools or in a public space in their community; the site will be determined by the project leader. Schools, as evidenced in the letters of commitment, must implement the community project as a condition of their participation in the program. Grant funds will be given as seed money to implement the project. Schools may use this money to implement a small scale community project or they may wish to leverage these funds with other resources to scale up the project.

Dissemination

Beginning Spring, 2016 and lasting through the remainder of the project period, youth participants will have the opportunity to work with different audiences to share the united symposium information and activities. Program participants will disseminate symposium deliverables at pre-determined days throughout their community. These may include school presentations, community meetings, or a hosting a table at a local festival or informal education institution. For example, students may present ideas for a community rain water garden with corresponding signage.

Taking the results of the Symposium "on the road" ensures that the resources and information exchanged at the original conference will be circulated to a wider audience, and further enhances teen communication and networking skills. These efforts serve to elevate the issue of clean water and the need to educate the community on how to maintain this essential resource.

Evaluation

Mystic Aquarium will evaluate the effectiveness of this initiative as a method of engaging and educating teen volunteers. Specifically, the evaluation will specifically focus on the Symposium and will look to answer questions such as:

- Did the Symposium increase participants' comfort level with the content material they conveyed to the public?

- Did the Symposium increase participants' content knowledge of the material they conveyed to the public?
- How well does the format of the Symposium work?
- How could Mystic Aquarium refine and improve program delivery?

To collect data, Mystic Aquarium will develop pre-and post-surveys that will be distributed to all youth participants. The confidential pre/post survey will evaluate participants' content knowledge of clean water, comfort level in teaching about water preservation and overall satisfaction with the Symposium. Clean data (with no identifying features) will be analyzed with the primary goals of the Symposium, and refining program delivery so that it may be used as a model for future teen and issue-specific professional development initiatives.

Partnerships

Partnerships are very important to this project's success. These partnerships include:

Coastal Environmental Services: Coastal Environmental Services of Southeastern Connecticut (CES) is a non-profit organization dedicated to keeping local waters clean. CES operates pump-out boats on the Mystic River, Thames River, and all waterways in between. CES brings pump-out boats directly to vessels and provides the pump-outs free of charge. The direct and no-cost service helps motivate boaters to protect the waters from pollution and reduces the temptation to discharge waste into the waterways. Each year, CES provides pump out service to 100 boaters, and has developed relationships throughout the boating community. CES will assist with project planning and content development, and will host the on-the-water experience for Symposium participants.

Schools: Mystic Aquarium has longstanding relationships with school districts across the state of Connecticut and will utilize these relationships to recruit participation in the project. Mystic Aquarium seeks to engage five schools and 25 youth; a reasonable estimated based on past programs. All partner institutions have access to teens, particularly those from underserved communities, as well as active youth groups with a pre-identified interest in environmental issues. Their participation in activities in partnership with Mystic Aquarium leads all participating institutions to have an understanding of what to expect from the project, and with existing environmental clubs/groups in place at each institution, allow for a project impact that will extend beyond the project period. Mystic Aquarium will leverage its relationships with schools in urban areas, which span a diversity of areas within the LIS ecosystem including inland, riverine, and coastal environments. The Aquarium has already started to gauge project interest among schools, especially with those who have participated in prior Aquarium-led teen initiatives, and confirmed partners to date are: New London High School, New London, CT, Marine Science Magnet High School of Southeastern Connecticut (Groton, CT), and The Sound School (New Haven, CT).

- Participate in an informational conference call prior to the Symposium;
- Recruit youth participants, ages 14-17, to participate in the LIS Water Quality Symposium to be held at Mystic Aquarium;
- Dedicate one adult staff person to chaperone and serve as the site contact when teens from regional facilities visit;
- Conduct the final action project at a community site; and
- Contribute to program evaluation efforts.

Please see the letters of commitment included as supplementary documents with this application as evidence of these institutions' commitment to and support of this project. Mystic Aquarium estimates that it will engage a total of five schools in this project; each school will bring five students for a total of 25 students reached.

Additionally, the project will consult with the EPA, the Connecticut DEEP, and the Town of Stonington (CT) in efforts to involve them in the Symposium and provide teen participants with access to professionals in the field.

V. Organizational Capacity and Programmatic Capability

The mission of Mystic Aquarium, a division of Sea Research Foundation, is to inspire people to care for and protect our ocean environment through conservation, education, and research. Mystic Aquarium develops and distributes hallmark programs and other unique, educational and conservation-focused initiatives. Located approximately halfway between the New York and Boston metropolitan areas, the Aquarium is the state of Connecticut's largest non-casino tourist attraction, as well as the largest cultural attraction in New England outside of Boston. Engaging children and adults of all ages, and those from underserved and underrepresented areas in particular, in hands-on educational explorations to help them better understand and appreciate the ocean's importance is a cornerstone of the Aquarium's mission.

Mystic Aquarium maintains a diverse collection of over 4,000 animals, including teleost and elasmobranch fishes, invertebrates, reptiles, amphibians, and marine mammals. Among this collection are threatened or endangered species, including beluga whales, stellar sea lions, fur seals, and African penguins. Since the doors first opened in 1973, the 18 acre facility has hosted more than 20 million visitors, provided educational programs for over 2 million children and adults, published more than 150 scientific reports, and pioneered the care, display and study of thousands of species of marine life. Mystic Aquarium provides an ideal venue for educating and inspiring over 700,000 people per year to care for and protect our oceans.

As a leader in the aquarium and marine research communities, Mystic Aquarium has made significant advances in marine science. Based on the campus of Mystic Aquarium, staff bring particular expertise in neuroimmunology, the study of the interactions between the nervous and immune systems and how natural and anthropogenic stressors affect them (e.g., oil and pollutants, loud sound, climate change), veterinary medicine, particularly developing and improving prognostic and diagnostic indices and therapeutic regimens for aquatic animals, as well as infectious disease, with emphasis on zoonoses. The research program regularly partners with major universities and research centers around the world to promote ocean health and better understand the interactions between aquatic animals, their environment, and humans.

Mystic Aquarium's Education Department conducts formal and informal educational programming through onsite and outreach opportunities that reach learners of all ages. The Aquarium is the largest informal science education provider in Connecticut, reaching 100,000 students annually. Its offerings span far beyond the confines of its campus in Mystic, Connecticut, through a robust Traveling Teachers program, work study programs and special events for students with intellectual disabilities, a partnership with the local naval base that brings families of active duty military to enjoy a day of fun and learning on the coast, camp experiences for families affected by domestic violence, and coastal cleanup and other conservation activities for families and local residents. The Aquarium's ability to offer inclusive learning opportunities to people of all ages, socioeconomic

status, ethnic origins, languages, and physical abilities was recognized in 2014 by winning the Institute of Museum and Library Services' National Medal, the nation's highest honor for service to the community, and the Angela Peterson Excellence in Diversity Award, the Association of Zoos and Aquarium's top honor for excellence in workforce and audience diversity.

Mystic Aquarium has the management, programmatic and administrative infrastructure in place to manage the requested funds and to deliver the proposed services. The organization has an annual operating budget of over $18 million for its renowned Aquarium, international research institute, deep-sea exploration team, and robust educational outreach operations. Further, it has an established track record of managing federally-funded, large-scale, and nationally-focused projects. From animal care, to research, to administrative support services such as finance and accounting, human resources, and grant writing responsibilities, the Aquarium is well-qualified to carry out the proposed project. The Aquarium has developed and executed a successful, nationally recognized educational and cultural exchange program focused on belugas and research for native Inupiat and Native American youth; and has a well-established track record of hosting and providing research experiences for undergraduates from all backgrounds.

Past History of Managing Federal Grants: Mystic Aquarium has a rich history of managing federal grants of local and national scope. Funders include the Institute of Museum and Library Services, NOAA, Office of Naval Research, and Department of Justice. A related project funded by NOAA is outlined in Section VII, and details on the 21 other federal grants awarded in the past five years are included as an appendix to this application.

VI. Qualifications of the Project Manager

MaryEllen Mateleska, Director of Education and Conservation, is responsible for managing conservation messaging and environmental initiatives on-site at Mystic Aquarium as well as with public visitors of all ages. Ms. Mateleska manages all teen initiatives at Mystic Aquarium, including its Youth Conservation Corps, and will coordinate with various Aquarium departments and partners throughout the project period to provide youth with an engaging and informative experience. Further, she has served as the project director of two large NFWF and NOAA grants, lessons from which will be leveraged for this project. Further, Ms. Mateleska manages the Education Department's school programs, including scheduling and curricular alignment. Ms. Mateleska was on the Dean's List and graduated from University of New Hampshire with a B.S. in Zoology.

During the project period, Ms. Mateleska will serve as the project lead, ensuring that the project remains on-time and on-budget. She will manage all partner relations, project meetings, creation and dissemination of educational messaging, and stewardship projects. Utilizing her 13+ years of experience in environmental education and developing programs for students in at-risk communities, Mateleska will guide the project such that optimal outcomes are met.

VII. Past Performance in Reporting on Outputs and Outcomes

Mystic Aquarium has a rich history of experience with executing large federally funded programs as well as those funded by private foundations. A recent grant that is similar in size, scope, and relevance to the proposed project is a 2013 cooperative agreement with NOAA. Details follow:

Award Number:	NA13NOS4630070
Recipient Organization:	Sea Research Foundation, Inc.

Project Title:	Teen Marine Debris Initiative
Funding:	Federal: $ 20,715.00 | Match: $ 21,324.00
Award Period:	09/01/2013-08/31/2014
NOAA Contact:	Asma Mahdi, Outreach and Communications Specialist
Project Lead:	MaryEllen Mateleska, Dir. of Education & Conservation, Mystic Aquarium
Reports:	All programmatic and financial reports have been submitted

The overarching goal of this program was to increase public awareness and knowledge about the issue of marine debris and to enlist their help in reducing its impact, particularly with regard to land-based litter and derelict fishing gear. Utilizing the enthusiasm and action-oriented nature of teens, the objectives of this project were to:

- Increase public awareness and education of the threats that marine debris presents to ocean and coastal health;
- Motivate people to actively participate in efforts to protect and restore marine resources; and
- Provide tangible actions for the public to take to mitigate their impact on marine resources.

Project deliverables were:

- Professional development opportunities for teenage volunteers that introduced them to the issue of marine debris and methods of interpreting this message; and
- The creation of a marine debris interpretation guide and associated resources for project participants to share with their facilities.

During the Teen Marine Debris Initiative, thirty-five high school and college students, along with seven educators from three states (CT, MA, RI), participated in the project. This included students participating in the student summit and subsequent mini-sessions. Project participants represented three informal learning centers, 12 towns, two colleges, and six high schools.

An evaluation illustrated a clear increase in knowledge about and communication of marine debris topics. Most notably, the evaluation showed:

- A 75% increase in the understanding of watersheds and the role they play in ocean pollution.
- On a scale ranging from 1 to 5, with 5 being the most comfortable with communicating marine debris topics with the general public; participant comfort level increased from an average of 3 to an average of 4.4
- On a scale ranging from 1 to 5, with 5 being the most comfortable with communicating marine debris topics to teen peers; participant comfort level increased from an average of 3 to an average of 4.2
- A noted increase in the awareness of the impact that teens (individuals ages 13-24) have on mitigating the impacts of marine debris
- A 100% approval rating of the marine debris summit and its effectiveness to educate teens on marine debris.

Additionally, over 15,000 Aquarium visitors were reached during on-site events and off-site public programming events held in conjunction with this teen program.

VIII. Quality Assurance Project Plan (QAPP) Information

No environmental or new data will be collected during this project. A QAPP will not be necessary.